

GOVERNOR’S TASK FORCE ON STEM EDUCATION K-12

PLAN FOR DECEMBER 2015-JUNE 30, 2016

EMPOWERING TEACHERS

Working Group: Brian Blake, Sally Jean, Todd LaMarque, Leslie McRobie and Annie Wallace. STEM DoE advisor: Eric Feldborg

CHARGE: develop and act upon implementation plan for STEM Task Force “Empowering Teachers” recommendations indicated below.

Recommendation 7. STEM Learning in the Classroom: Every Day in Different Ways

The goal is to help teachers integrate STEM practices into current mathematics and English language arts curricula. Where possible, a STEM specialist at the school or district level can provide the support teachers need to integrate STEM into the curriculum every day in different ways. Districts committed to STEM literacy can integrate science and math applications into pre-high school education every day in different ways, large and small. Teachers can apply technology and engineering concepts to math and science lessons in team projects, making STEM relevant and exciting for all students, especially for those who may not be inclined to learn math and science as theory or by rote.

This recommendation addresses three key barriers to STEM education -- the tightly packed K-8 schedule, the need for diverse hands-on learning opportunities and the lack of applied science expertise among teachers in K-8 grades.

Recommendation 8. Teacher Professional Development: Enhancing STEM Excellence

New Hampshire is fortunate to have outstanding educators across the state. However, the state has a paucity of science and STEM-qualified teachers, especially in the early grades, where most teachers lack specific training in math or science. As expectations rise for STEM education, there is a need to better prepare and resource our teachers.

The New Hampshire Board of Education and Department of Education should reformulate STEM teacher preparation and requirements to include enhanced STEM certificates, endorsements and micro-credentials, as well as pedagogical training that enables STEM professionals to become effective teachers.

ISSUES: Background

NH teachers report confusion as to what qualifies as “STEM teaching.” Does it include teaching all STEM subjects together, or teaching one or two subjects together such as math and science? What goals should be met? What measures or standards of qualify need to be adopted for STEM

teaching? For example, math, science and English-language arts are each required to meet state content achievement standards, but STEM has no similar achievement standards.

When and how can STEM be incorporated into an already crowded teaching schedule, especially at the elementary and middle school level, where the focus is on math and English-language arts?

NH teachers lack sufficient access to organized and centralized resources for teaching STEM such as curriculum, and classroom materials; likewise teachers need a centralized repository of STEM professional development opportunities and materials.

Finally, and of critical importance, teaching STEM requires enhanced preparation in content and pedagogy (such as project-based and inquiry-based teaching) as well as appropriate certification of mastery. New approaches are needed.

GOALS FOR 2015-2016 FISCAL YEAR

Articulate a working definition and common language for understanding what constitutes STEM teaching.

Provide best practice models for incorporating STEM subjects into already crowded schedule, focusing on elementary and middle school

Establish a curated centralized repository for STEM teaching aids and curriculum packages for K-12 teachers

Establish a curated and annotated centralized repository for STEM-related professional development courses, workshops, and other resources for teachers

Research and prepare a working paper for the NH Department of Education on best practices for STEM credentialing, especially with regard to micro-credentialing options.

ACTION STEPS, DELIVERABLES, MILESTONES AND SUCCESS METRICS.

Common definition and language to define STEM and STEM teaching. Initiate discussions with the NHDoE and key stakeholder groups to develop a framework for understanding STEM and STEM-teaching. Working paper issued by May 2016. (This working paper will be intended to share ideas and elicit feedback). **Success metric: TBD**

Best practice models for incorporating STEM subjects into daily or weekly teaching schedule. Collect and recognize best practice models. A variety of recognition models are being considered. May 2016. **Success Metric:** Feedback from teachers, principals and superintendents

Centralized repository of STEM teaching aids and curriculum packages. Support work of Task Force to create website to house online repository. This working group will partner with Department of Education to encourage districts to share resources by submitting to the website. Initially submissions will be curated by the STEM Director, Department of Education. Jan-June, 2016. **Success Metric:** Feedback from educators

Centralized repository for STEM-related professional development. Same as #3 Jan-June, 2016. **Success Metric:** Feedback from educators

Working Paper with NH Department of Education on credentialing best practices. Determine what is already in place in each of the STEM area certifications, and learn how a STEM certification might be different from certifications in each STEM content area. Are micro-credentials appropriate, and if so, in what cases? Examine potential impact of recommended actions. May 2016: working paper that summarizes conversations and findings in preparation for next round of rulemaking review and changes for science and math teaching credentials. Success metric: TBD

DELIVERABLES SUMMARY

Working paper on STEM definitions

Online curated repository for teaching aids, curriculum packages

Online curated repository for professional development opportunities and resources

Working paper on best practice approaches to STEM credentialing